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DATE: October 21, 2009

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FROM: Jill A. Fahrlander **PHONE:** 608.283.0124

SENT BY: Kay Collins **EXTENSION:** 27514 **LOCATION:** 9th Floor

RE: U.S. Patent Application No. 10/666,998
Inventor: Andrei Laikhter, et al.
Filed: September 19, 2003
Entitled: ANTHRAQUINONE QUENCHER DYES, THEIR METHODS OF PREPARATION AND USE
FOR DISCUSSION PURPOSES

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CLIENT-MATTER NUMBER:	013670-9004-US00	SENDER'S ACCOUNT NUMBER	0836

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Dear Examiner Staples:

The Agenda for our October 21, 2009 telephonic Examiner Interview is attached. The following is the number to call.

CONFERENCE CALL INFORMATION:

Dial In to 888-546-0559 and then dial passcode: 608 283 0124.

Thank you.

Jill A. Fahrlander

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PAGE 1/3 * RCVD AT 10/21/2009 10:57:07 AM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/18 * DNIS:2739053 * CSID:608 283 2275 * DURATION (mm-ss):01-46

Agenda for Telephonic Interview Regarding US Application No. 10/666,998

Date and time

October 21, 2009 at 4 PM EST

Dial-in information

Dial In: 888-546-0559
Participant Passcode: 608 283 0124

Participants

Dr. Joe Walder, President of Integrated DNA Technologies (Assignee)
Attorney John Petravich, Patent Counsel, Integrated DNA Technologies
Attorney Jill Fahrlander, Patent Counsel, Michael Best & Friedrich

Agenda

Discuss rejection of claims 51-60 as being anticipated by Batz (US Patent No. 6,117,973) and rejection of claim 61 as being unpatentable over Batz and Jenne (US Patent No. 6,451,535).

Summary of Examiner's position

The Examiner cites to column 21, lines 42-63 and Example 11 of Batz as teaching methods of detecting a target DNA in a sample using an oligonucleotide labeled with an acridine fluorophore, the fluorescence of which can be reduced by energy transfer or ground state quenching by a quencher which is an anthraquinone moiety (Example 11) wherein the quencher moiety can be an α-aminoanthraquinone according to formula VIa of claim 7.

Applicants' position

Batz teaches throughout methods of detecting a nucleic acid by binding a probe having a polymeric backbone other than a phosphodiester backbone labeled with an electron donor, an electron acceptor, or both. The presence of the nucleic acid is detected by determining the transfer of an electron or hole from the electron donor to the electron acceptor (column 4, lines 11-28).

In contrast, Applicants' invention is directed to methods employing energy transfer or ground state quenching between a fluorophor and an α-aminoanthraquinone, not by electron transfer between an electron donor and an electron acceptor.

In a passage cited by the Examiner, Batz discloses that quenching of a probe labeled with an electron donor and an electron acceptor (e.g., an acridine/quinone pair) was by electron transfer (column 21, lines 42-52), and that quenching by electron transfer system can be improved by enhancing the rate of electron transfer by using a more easily reduced electron acceptor (column 21, lines 52-54).

Example 11 describes using electron transfer quenching to detect hybridization. (Column 35, lines 63-64). Batz discloses that "the choice of electron transfer rather than energy transfer in the present invention arises from the fact that fewer restrictions are placed on the donor and acceptor moieties for photoinduced electron transfer chemistry" (column 36, lines 10-14). Batz distinguishes their electron transfer-based methods from the energy transfer-based methods of Tyagi (Nature Biotechnology 14:303-306, 1996). Tyagi use the quencher 4-(4'-dimethylaminophenylazo) benzoic acid (DABSYL), which is not an anthraquinone quencher.

Example 11 employs "an anthraquinone moiety (Q1), which functions as an electron acceptor " (column 36, lines 20-21). Q1 was synthesized as described in Example 1 and its structure is shown in Fig. 8. It is not an aminoanthraquinone, let alone an α-aminoanthraquinone.

Further, Batz teaches modifying electron acceptors like Q1 to make it more easily reduced so as to enhance the rate of electron transfer. Clearly, modifying Q1 to include an α-amino group would not make it more easily reduced (column 21, lines 52-54).

Claim 7 depends from claim 1, which encompasses a molecule of formula VIIIa, VIIIb, or VIIIc, each of which includes a motiety designated "L". L is broadly defined as being a non-nucleobase electron donor or acceptor moiety which is capable of participating in the complete transfer of an electron. (Column 45, lines 31-33). Claim 7 requires that L have one of three general formulae that include VIa, a subgeneric structure that encompasses millions of compounds. However, contrary to the Examiner's conclusion, α-aminoanthraquinone is not taught by claim 7, because L must be capable of participating in the complete transfer of an electron, and α-aminoanthraquinones are not capable of complete transfer of an electron.

As for the Examiner's theory that the structures encompassed by claim 7 are inherently capable of energy transfer or ground state quenching, the only anthraquinones that were synthesized were Q1 and Q2 (Fig. 9), neither of which is an α-aminoanthraquinone. Hence, α-aminoanthraquinones were not tested for the ability to quench a fluorophor, and therefore, α-aminoanthraquinone quenching by energy transfer was therefore not inherently disclosed.